

# STOKES–EINSTEIN RELATION IN SIMPLE CHARGED AND NEUTRAL SYSTEMS

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The Stokes-Einstein (SE) relation between the self-diffusion and shear viscosity coefficients operates in sufficiently dense simple fluids not too far from the fluid-solid phase transition. By considering two simple model charged (Coulomb and Debye-Hückel or screened Coulomb) fluids as well as two simple model neutral fluids (Lennard-Jones and Coulomb) we demonstrate where exactly on the respective phase diagrams the SE relation holds. It appears that the reduced excess entropy  $s_{\text{ex}}$  can be used as a suitable indicator of the validity of the SE relation. In all cases considered the onset of SE relation validity occurs at approximately  $s_{\text{ex}} \lesssim -2$  [1]. In addition, we discuss the location of the crossover between the gas-like and liquid-like transport properties of simple fluids.

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1. Khrapak S. A. and Khrapak A. G. // Phys. Rev. E 2021. V.104. No.10. P.044110.